Microsoft® Exchange 2000 Server Coexistence and Upgrades

PT103 **Version 1.0**

From the Exchange 2000 Server Pre-emPt Series

Paul Bowden
Program Manager - Europe
Microsoft Exchange Server Product Unit

© 1999 Microsoft Corporation. All rights reserved.

The information contained in this White Paper represents the current view of Microsoft Corporation on the issues discussed as of the date of publication. Because Microsoft must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Microsoft, and Microsoft cannot guarantee the accuracy of any information presented after the date of publication.

The example companies, organizations, products, people and events depicted herein are fictitious. No association with any real company, organization, product, person or event is intended or should be inferred. This White Paper is for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS DOCUMENT.

BackOffice logo, Microsoft, Outlook, Win32, Windows, and Windows NT are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Other product or company names mentioned herein may be the trademarks of their respective owners.

Other product or company names mentioned herein may be the trademarks of their respective owners.

Microsoft Corporation • One Microsoft Way • Redmond, WA 98052-6399 • USA

Contents

MICROSOFT® EXCHANGE 2000 SERVER COEXISTENCE AND UPGRADES.....I

CONTENTS.....III

ACKNOWLEDGMENTS.....V

DOCUMENT VISION AND SCOPE.....6

INTRODUCTION.....7

Exchange 2000 Server Coexistence and Upgrade Basics.....7
Dependencies on Windows 2000 and Active Directory.....7

COEXISTENCE BETWEEN EXCHANGE 4.0, EXCHANGE 5.*X*, AND EXCHANGE 2000.....8

What Is Coexistence?.....8
Server Version Coexistence.....8
Directory Coexistence.....9
Site Replication Service.....10
Site, Administrative Group, and Routing Group Coexistence.....12
Proxy Address Coexistence.....13
Messaging Coexistence.....14
Route Coexistence.....16
Site Services Account and Authentication.....16
User Data Coexistence.....17
Outlook Web Access Coexistence.....19
Taking Advantage of Exchange 2000 Without Upgrading Existing Servers.....19

UPGRADING TO EXCHANGE 2000 SERVER.....21

Methods of Upgrading.....21
Preparing for the Upgrade.....21
Active Directory and Domains.....21
Hardware and Software Requirements for Exchange 2000 Server.....22
Exchange 2000 Clients.....23
What Differences Will Users Notice After the Upgrade?.....23
In Place Upgrade Method.....23
Move Mailbox Upgrade Method.....23
Steps for Moving Mailboxes to Exchange 2000.....23
Steps for Moving Public Folders to Exchange 2000.....23
Leapfrog Upgrade Method.....23
Server Upgrade Order.....23
Steps Performed During the Upgrade Process.....23
Directory Upgrade.....23
Store Upgrade.....23
MTA and Connector Upgrades.....23
Legacy Mail System Connector Upgrades.....23
After the Upgrade.....23

DOMAIN UPGRADES AND ACTIVE DIRECTORY ACCOUNT CLEANUP.....23

UPGRADE SCENARIOS AND WALKTHROUGHS.....23

Scenario 1: Ramona Publishing, Ltd.....23
The Upgrade Process.....23
Notes.....23

Scenario 2: ProElectron, Inc. 23
Reasons for Migrating to Exchange 2000 *23*
Challenges *23*
Upgrade Methodology *23*
U.S. Upgrade Process *23*
U.K. Upgrade Process *23*
Sweden Upgrade Process *23*
Australia Upgrade Process 23

Acknowledgments

Many thanks to the following people for their time and enthusiasm. No white paper is produced without many people going out of their way to assist.

Exchange Product Group

Ken Ewert

Peter Waxman

Bogdan-George Pintea

Neil Koorland

John Freeman

Neil Shipp

David Madison

Windows 2000 Product Group

Steven Judd

Don Hacherl

Behrooz Chitsaz

Microsoft Consulting Services, UK

Peter Nilsson

Darren Strange

Others

Laura Payne (Exchange Program Manager, Service Readiness)

Jeff Wilkes (PSS Beta Support Team Leader)

Bryan Hunt (PSS Beta Support Team)

Everyone on PlatChat

Philip Beville, Richard Minty, and the rest of the Exchange Global Engineering team at Credit Suisse First Boston

Document Vision and Scope

The purpose of this document is to give you a better understanding of how Microsoft® Exchange 2000 Server can coexist with an existing Exchange 4.0 and Exchange 5.*x* deployment, and to present strategies for upgrading to Exchange 2000.

After reading this white paper, you should understand how Exchange 2000 can work with existing Exchange sites, how coexistence between Exchange and Active Directory is accomplished, and the benefits Exchange 2000 brings to existing Exchange networks. Additionally, two scenarios are presented to demonstrate how you can upgrade existing Exchange deployments to Exchange 2000, from simple site upgrades, to complex, multi-site, multi-domain upgrades. This paper also covers rapid upgrades and multi-phase upgrades.

The information presented here should be part of your learning cycle for Exchange 2000 Server. To gain a full understanding of Exchange 2000 technologies, you should read the other documents in this series:

- PT100 – Windows 2000 and Exchange 2000 Server Terminology Primer
- PT101 – Deploying the Active Directory Connector
- PT102 – Exchange 2000 Server Directory Access and Integration with Windows 2000
- PT104 – Understanding Message Routing in Exchange 2000 Server
- PT105 – Understanding Exchange 2000 Server Storage Technology
- PT106 – Deploying Exchange 2000 Server Real-Time Collaboration Services
- PT107 – Collaboration with Exchange 2000 Server

Note The information in this document is based on Microsoft® Windows® 2000 Release Candidate 2 (RC2) and Microsoft Exchange 2000 Server Beta 3. This release of Exchange 2000 Server does not support in place upgrades from earlier releases of Exchange; therefore, this version of the document provides only basic upgrade information.

Introduction

Exchange 2000 Server Coexistence and Upgrade Basics

Microsoft® Exchange 2000 Server is architecturally different from earlier releases of Exchange Server. The new components of Exchange 2000 provide a much more flexible, integrated, and scalable architecture than earlier releases of the product. When considering an existing Exchange deployment, whether it is based on version Exchange 4.0, Exchange 5.0, or Exchange 5.5, it is important to understand your coexistence and upgrade options for moving on to this next release. Following are some common questions:

- Can I install an Exchange 2000 Server into an existing Exchange 5.*x* site?
- Can I use the new features in Exchange 2000 without upgrading all of my existing Exchange servers and Microsoft® Outlook® clients?
- Can I upgrade directly from Exchange 4.0 and Exchange 5.0 to Exchange 2000?
- If I perform an in place upgrade, does the existing data have to be converted to a new format?
- How do I perform upgrades with minimal disturbance to my users?

Because Exchange 2000 no longer uses its own directory service, you might think that upgrading from Exchange 5.5 to Exchange 2000 will be difficult; however, the tools and components provided with Exchange 2000 make this transition relatively easy.

Exchange Server 5.5 is minimally reliant on the underlying Microsoft® Windows NT® 4.0 domain structure, and because of this, deployment and support personnel may have little experience with the operating system. Because Exchange 2000 tightly integrates with Active Directory, you will need to understand the prerequisites and dependencies of Active Directory before beginning to design your Exchange 2000 Server deployment.

As with any upgrade, the level of coexistence required and the time it takes to upgrade is directly related to the size and complexity of your existing Exchange and Windows NT deployment.

As a prerequisite to this paper, you should have already read the following white papers:

- PT101 – Deploying the Active Directory Connector
- PT102 – Exchange 2000 Server Directory Access and Integration with Windows 2000

These are available on the Microsoft Web site at http://www.microsoft.com/exchange/prodinfo/2000/default.htm.

Dependencies on Windows 2000 and Active Directory

Exchange 2000 Server relies on Windows 2000 in three ways:

- Active Directory becomes the Address Book for Exchange Server and Outlook clients.
- Exchange 2000 uses and extends Windows 2000 SMTP and NNTP protocol stacks.
- Exchange 2000, like Windows 2000, uses Domain Name System (DNS) for name resolution.

Exchange 2000 is the first release of Exchange Server that relies completely on the directory provided by the operating system. Earlier versions of Exchange integrated with the Windows NT security model, but rich directory information was contained in a separate database (Dir.edb). Because of its new architecture, for Exchange 2000 to fully

coexist with earlier versions of Exchange, replication between Active Directory and the legacy Exchange 5.*x* directory must take place. Replication is coordinated by the Active Directory Connector (ADC), which is described fully in the white paper, *PT101 – Deploying the Active Directory Connector*.

Coexistence Between Exchange 4.0, Exchange 5.*x*, and Exchange 2000

What Is Coexistence?

Coexistence describes a configuration in which different versions of Exchange Server are installed in the same organization. Installing a server running Microsoft® Exchange 2000 Server in an existing Exchange 4.0 or Exchange 5.*x* site is known as running in *mixed mode*. The organization runs in either mixed mode or *native mode*. An organization running in mixed mode can accommodate all versions of Exchange. An organization running in native mode can accommodate only Exchange 2000, and no new Exchange 5.*x* servers can be introduced into the organization.

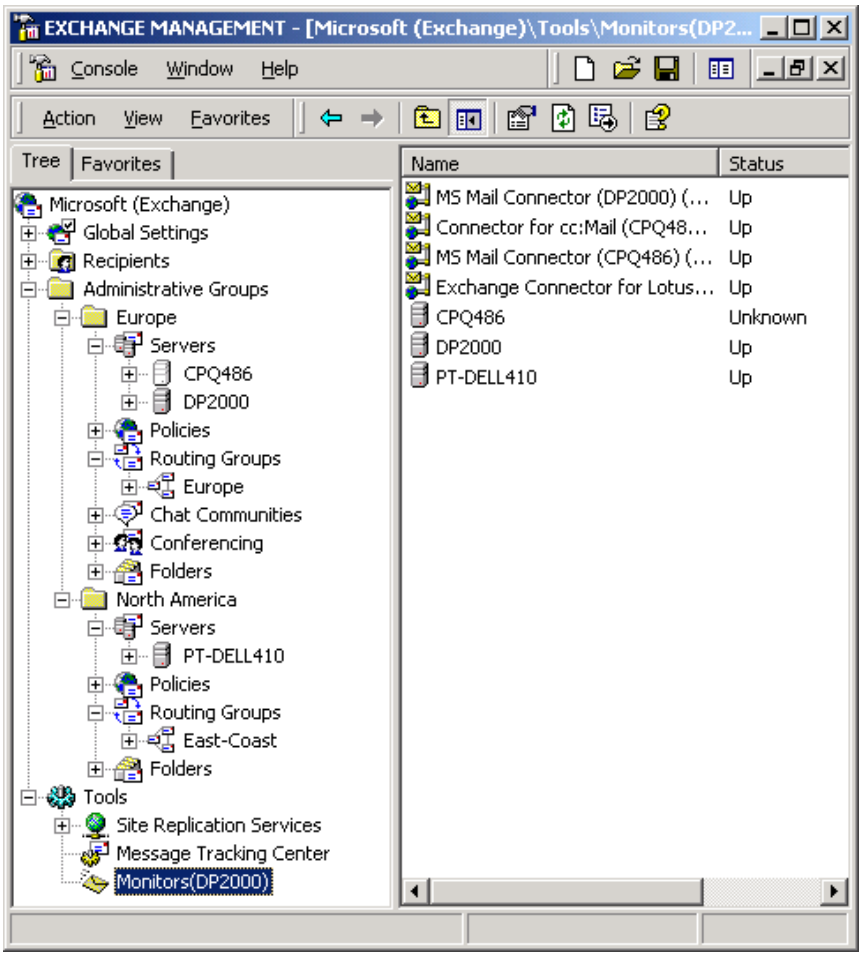
In a mixed-mode site, the rules that apply to earlier versions of Exchange apply to Exchange 2000 as well; for example, all servers in the site must use a common Site Services Account. But unlike earlier versions of Exchange, you do not need to upgrade the bridgehead servers of a site before you deploy Exchange 2000. You can upgrade servers in order of priority and necessity.

Server Version Coexistence

After you install the first Exchange 2000 server, you can still install earlier versions of Exchange to the site, although you will need a new version of the Setup program to install a server running an earlier version of Exchange.

After running Exchange 2000 Setup, you can specify whether you want the server to join the existing site, or create a new organization. An Active Directory forest can accommodate only one Exchange organization. If you decide to join an existing Exchange Server 5.5 organization, which is recommended if you have existing Exchange servers, the name of the existing Exchange 5.*x* organization is retrieved from the specified Exchange 5.5 server and replicated to Active Directory. The Exchange 2000 server will then be installed in the nominated site. If you decide to create a new organization, you will be prompted for a new organization name.

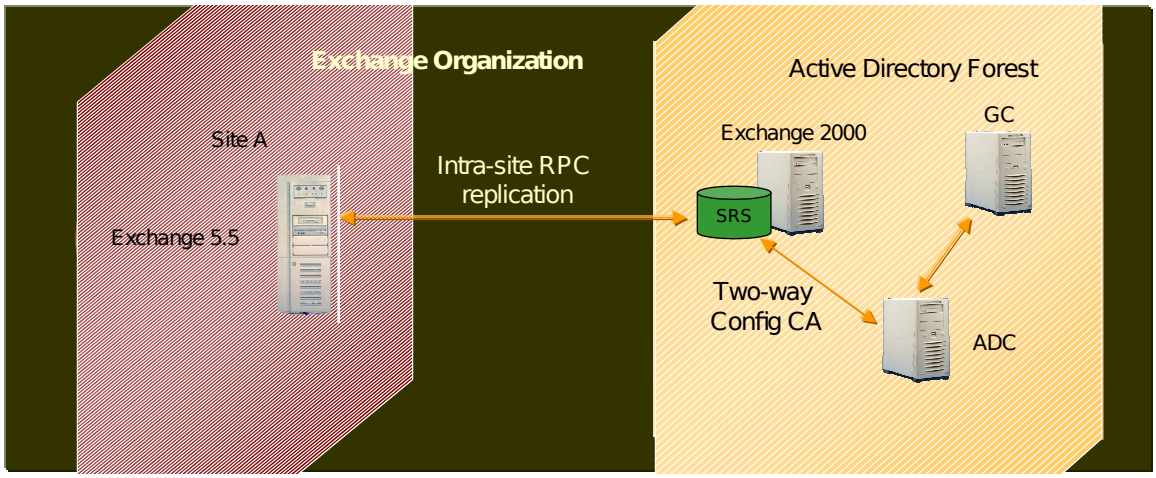
Exchange System Manager shows all versions of Exchange installed in the organization. Non-Exchange 2000 servers are shown as transparent objects.



Directory Coexistence

When an Exchange 2000 server is introduced into an existing Exchange 4.0 or 5.*x* site through either an installation or an upgrade process, Site Replication Service (SRS) and Active Directory Connector (ADC) are installed. These components work together to provide intra-site remote procedure call (RPC) replication and inter-site mail-based replication (MBR). ADC connection agreements between the Active Directory and the SRS database are automatically established to allow directory replication to occur.

To other Exchange 4.0 and 5.*x* servers in the site, the Exchange 2000 server appears as just another server. The servers send out directory replication notifications as usual, and the SRS database requests changes the same way as earlier versions of Exchange. In fact, the SRS database code is based on the Exchange 5.5 Directory Service (Dsamain.exe); hence, the similarity between the two services.



Site Replication Service

Site Replication Service (SRS) consists of a service that is activated and a database that is initialized when an Exchange 2000 server is introduced into an Exchange site in which no other Exchange 2000 servers exist, or when an Exchange 5.5 directory replication bridgehead is upgraded to Exchange 2000. New Exchange 2000 servers that are introduced into a site with other Exchange 2000 servers running have SRS installed but deactivated.

SRS is a holding point for directory replication flow between the Exchange 5.*x* directory and Active Directory. Although conceivably the ADC can perform this function itself by creating connection agreements directly between Active Directory and existing Exchange 5.5 servers, in some scenarios the ADC does not work. Because the ADC uses Lightweight Directory Access Protocol (LDAP) to replicate data, it requires direct network connectivity between the bridgehead servers. Configurations without full-time network connectivity, therefore, require a different solution.

As an example, consider the following simple Exchange 5.*x* site model. Because all directory replication occurs through messaging in Exchange 5.*x*, direct network connectivity is not required.

Although Active Directory supports Simple Mail Transfer Protocol (SMTP) replication between domains, how does replication occur if one location is upgraded to Active Directory and Exchange 2000 and the other is still using Exchange Server 5.*x*?

Site Replication Service runs on an Exchange 2000 server and responds to requests from directory replication bridgehead servers running earlier versions of Exchange for updated site information. This feature allows migration from Exchange 5.*x* to Exchange 2000 to occur at a varied pace throughout the organization. Because a large organization must be able to upgrade Exchange sites as required, SRS includes a Site Consistency Checker (SCC) to ensure that no replication links are triangulated in the organization. The SCC is based on the Knowledge Consistency Checker (KCC) in Exchange 5.5, and its function is to identify structural changes in both directories and to form replication links automatically.

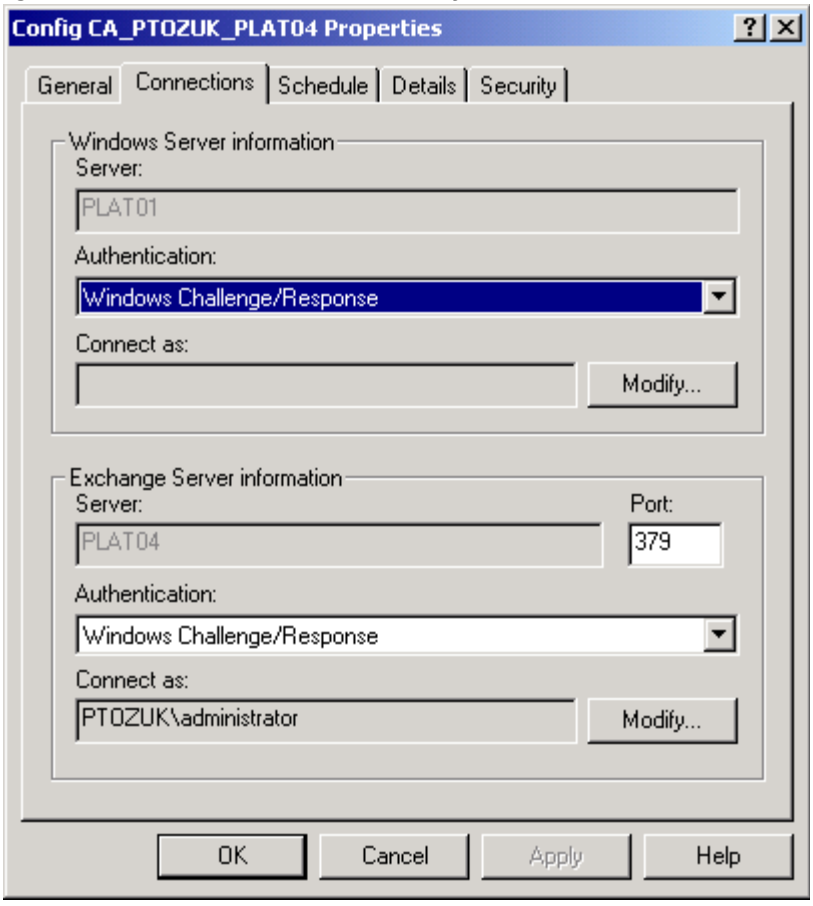
In Exchange Server 5.5, however, the KCC runs as part of System Attendant. The SCC is designed to run in-process with SRS. SRS has a high level of built-in intelligence for handling different configurations. For example, although SRS can handle directory replication requests from an Exchange 5.5 site, when those servers are upgraded to Exchange 2000 and Active Directory, SRS must recognize that all servers are now represented in Active Directory, and all replication can occur through standard Active Directory mechanisms. SRS, therefore, automatically disables directory replication connectors that are based on Exchange to ensure that replication data is not duplicated.

Taking this scenario further, what happens if you create a new site, and the server in that site is running Exchange 5.5? SRS not only must receive replication data from the new site, it must automatically create new ADC connection agreements so that configuration naming context and recipient data are replicated to Active Directory; therefore, SRS also must control connection agreements.

Site Replication Service consists of the following components:

- Site Replication Service (Srsmain.exe)
- Site Consistency Checker (which runs as part of Srs.exe)
- SRS database (Srs.edb) and transaction logs (ESE98 format)

SRS itself is very similar to the Exchange 5.5 directory service. The Named Service Provider Interface (NSPI), however, is disabled to prevent Microsoft® Outlook® clients from connecting with and using the Exchange 5.5 directory for resolution. Also, because the ADC only supports LDAP, SRS must run an instance of this protocol. To prevent port conflicts when Exchange 2000 is running on a domain controller, the LDAP interface for SRS monitors port 379 instead of 389. You can see this by looking at the following connection agreement that has been created by SRS.



When two Exchange 5.*x* servers are replicating the directory, they use the Directory Replication Agent (DRA) interface. To maintain full compatibility with earlier versions of Exchange, the DRA interface for SRS is automatically enabled.

Note For more information on the Exchange Server 5.*x* directory replication process, please refer to the white paper, *Advanced Backbone Design and Optimization,* on the Microsoft TechNet CD-ROM, or at the Microsoft TechNet Web site at http://technet.microsoft.com/cdonline/content/complete/srvnetwk/exch/technote/backtraf.htm.

Site, Administrative Group, and Routing Group Coexistence

The site concept in earlier versions of Exchange defined three boundaries: single-hop routing, a collective administration unit, and a namespace hierarchy. To provide a more flexible deployment and administration structure, all three boundaries are separate in Exchange 2000.

- Single-hop routing is now defined by a routing group.
- Collective administration is now defined by an administrative group.
- Namespace hierarchy has moved to Active Directory in the form of a domain.

When you install the first Exchange 2000 server into Active Directory, the organization object is created and a number of attributes are set. One of the attributes, **msExchMixedMode***,* defines the mode of the Exchange organization as mixed mode or native mode.

The Exchange organization in Active Directory is configured to start out in mixed mode, even if the first server is installed with the option of creating a new organization. This allows you to install an Exchange 5.5 server at a later time. The concept of mixed mode and native mode is very similar to the idea of mixed-mode and native-mode domains in Active Directory. No direct relationship exists, however, between the mode of the domain and the mode of an Exchange organization. The similarity exists only in terms of naming and restrictions on earlier versions. Mixed mode exists for backward compatibility, but it limits the system to constraints imposed by earlier software releases. You use native mode when all servers are upgraded to the latest software, and earlier release restrictions no longer apply.

In Exchange, the following limitations are applied to a mixed-mode organization.

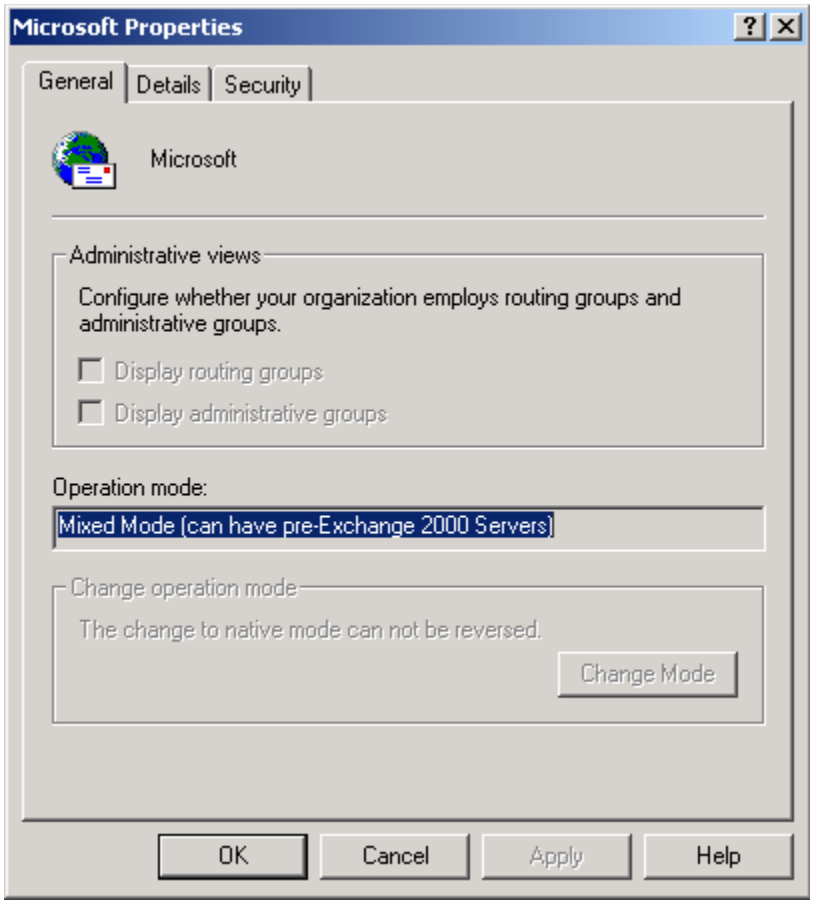
- Exchange 5.*x* sites are mapped directly to administrative groups.
- Administrative groups are mapped directly to Exchange 5.*x* sites.
- You cannot move mailboxes easily between administrative groups.
- You cannot move servers between administrative groups.
- Routing group membership must consist only of servers installed in the administrative group.

The last point requires further explanation. In an Exchange 5.*x* site, not only do you manage the servers as a single group, but all servers have direct, mesh-like connectivity for sending messages to one another. However, when an Exchange 2000 organization is in mixed mode, and Exchange 5.*x* sites are mapped one-to-one with administrative groups, you can subdivide the routing structure for the Exchange 2000 servers in the collection. A server, however, cannot belong to a routing group that is held under a different administrative group.

Note You cannot create multiple routing groups in the same administrative group in Exchange 2000 Beta 3.

As an example of how a single site can be subdivided into different routing groups, suppose that servers A, B, C, and D are all in the same site. Server A is running Exchange 5.5 and the other servers are running Exchange 2000. When a user composes a message on Server A that is addressed to a user on one of the Exchange 2000 servers, the Exchange 5.5 message transfer agent (MTA) process is to route the message directly to the other server. From an Exchange 5.5 perspective, the routing process must work the same way it always has. Now suppose that a user on Server D (running Exchange 2000) addresses a message to a user on Server A (running Exchange 5.5). Because Exchange 2000 can work under different rules, you can subdivide the administrative group into various routing groups, so that to get a message from Server D to Server A, it must go through Server C and Server B. This works even when an organization is in mixed mode because the ADC and SRS do not replicate routing groups and intra-administrative group connectors to the Exchange 5.5 environment.

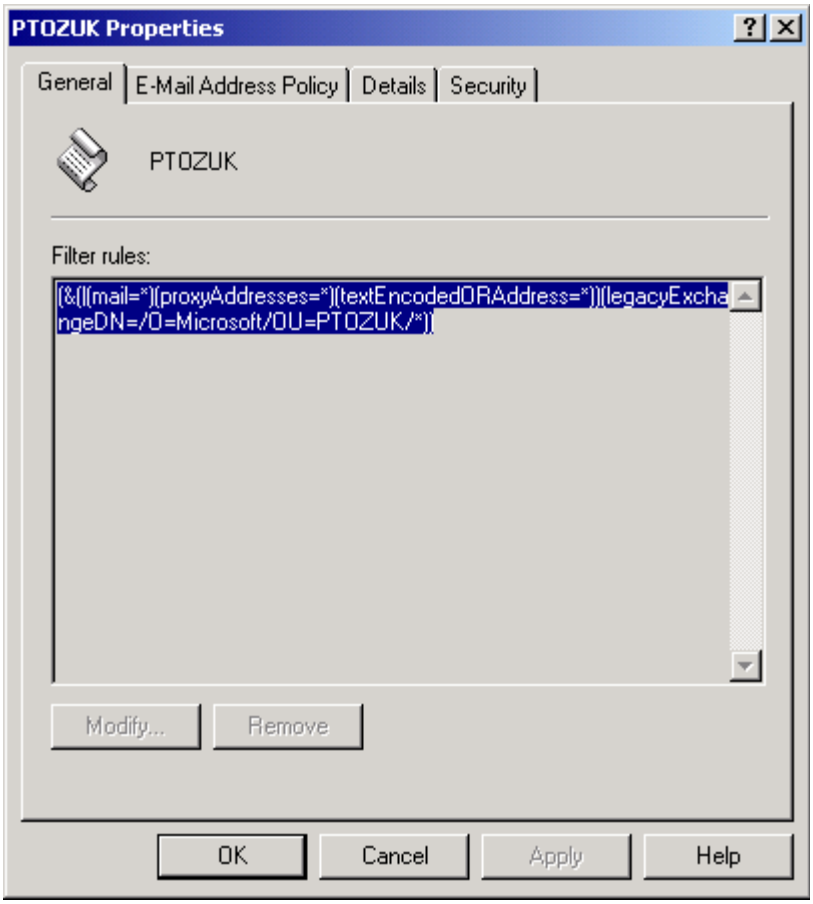
After you have completely upgraded the organization to Exchange 2000, or if you have created a new organization and you require full movement capabilities within the system, you can switch the organization to native mode. To do this is, you simply click a button in Exchange System Manager, shown in the following illustration. It is important to note, however, that after switching to native mode, you cannot go back to mixed mode, and you will no longer be able to install earlier releases of Exchange Server into the organization.



After switching your organization to native mode, you can move mailboxes to any server in the forest. Because users' X.500 Distinguished Name attributes remain the same, when users are moved, you do not need to re-create their MAPI profile, and replies to existing messages from other users will be delivered.

Proxy Address Coexistence

After joining an existing Exchange site, the proxy address settings for addresses such as SMTP, X.400, cc:Mail, and Microsoft Mail are copied to a recipient policy for users in that administrative group. This means that all users in the site or administrative group have the same proxy addresses generated. This policy cannot be removed and it must be the *highest* priority policy in the system. The RFC2254 rule of the policy looks for objects with a **LegacyExchangeDN** attribute set to the organization and site name of the site that was joined.

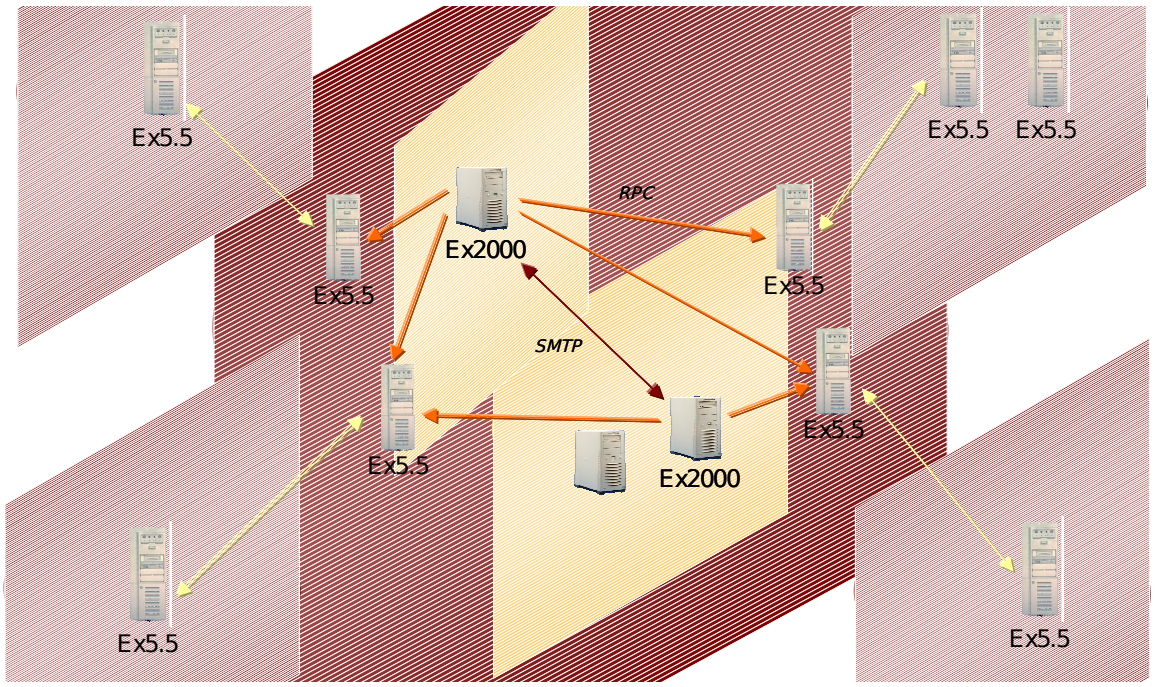


Messaging Coexistence

Although the native messaging transport protocol has changed to SMTP in Exchange 2000, an instance of the MTA still exists. There are, in fact, few differences between the Exchange 5.5 MTA and the Exchange 2000 MTA, except that the Exchange 2000 MTA uses LDAP to perform directory lookups rather than the Directory API (DAPI).

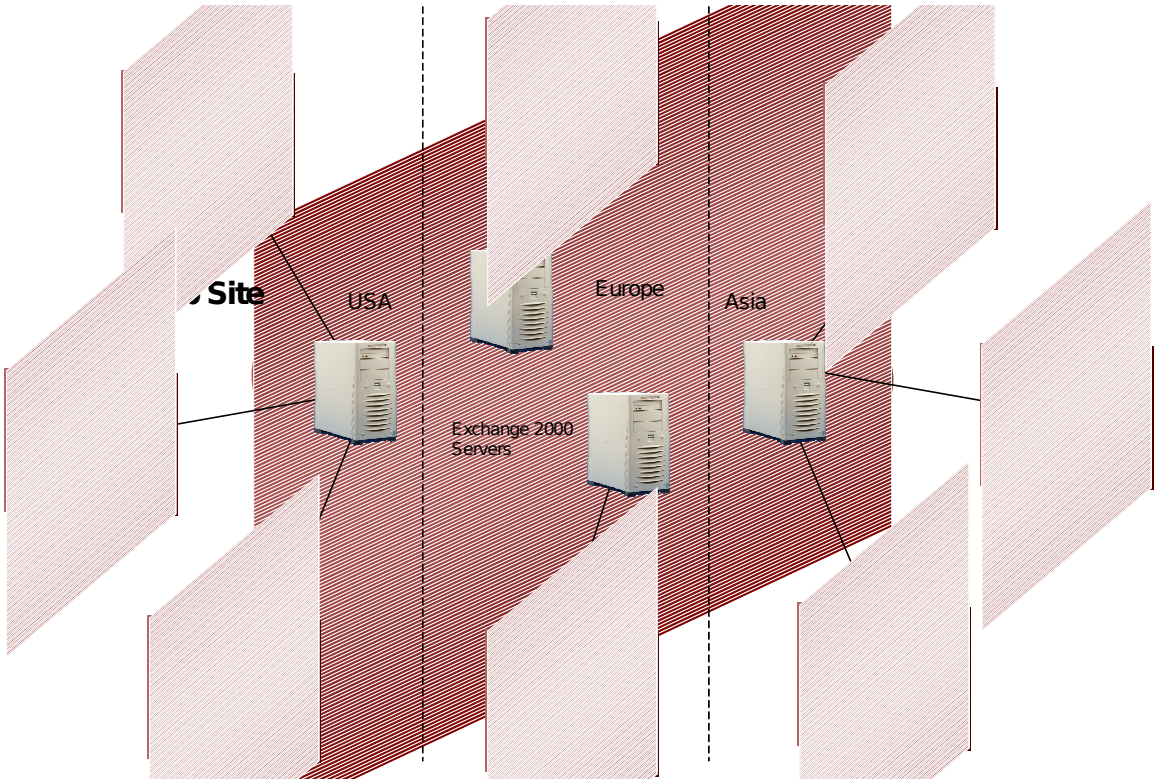
Additionally, if two or more Exchange 2000 servers exist in the site, they will detect each other and route messages to one another using SMTP rather than the legacy MTA protocol. This allows them to take advantage of the advanced queuing, routing, and link state algorithm that exists in Exchange 2000. Additionally, SMTP is asynchronous and can operate in very low-bandwidth network conditions (unlike RPC).

The following illustration shows how SMTP is used between Exchange 2000 servers, and how multiple routing groups can exist within a single site or administrative group.



In scenarios where there is low bandwidth or high network latency, it may be appropriate to first upgrade hub sites — Exchange sites dedicated to message switching — to increase message throughput.

For example, an international company has deployed a hub site so that spokes can have a local connection to the message switching network. In the past, the company may have experienced RPC timeouts and performance problems with this configuration because of network flux. With Exchange 2000 servers in the site, this is no longer an issue. To minimize risk, the company can install Exchange 2000 servers in the hub site and migrate the messaging and directory replication connectors one at a time.



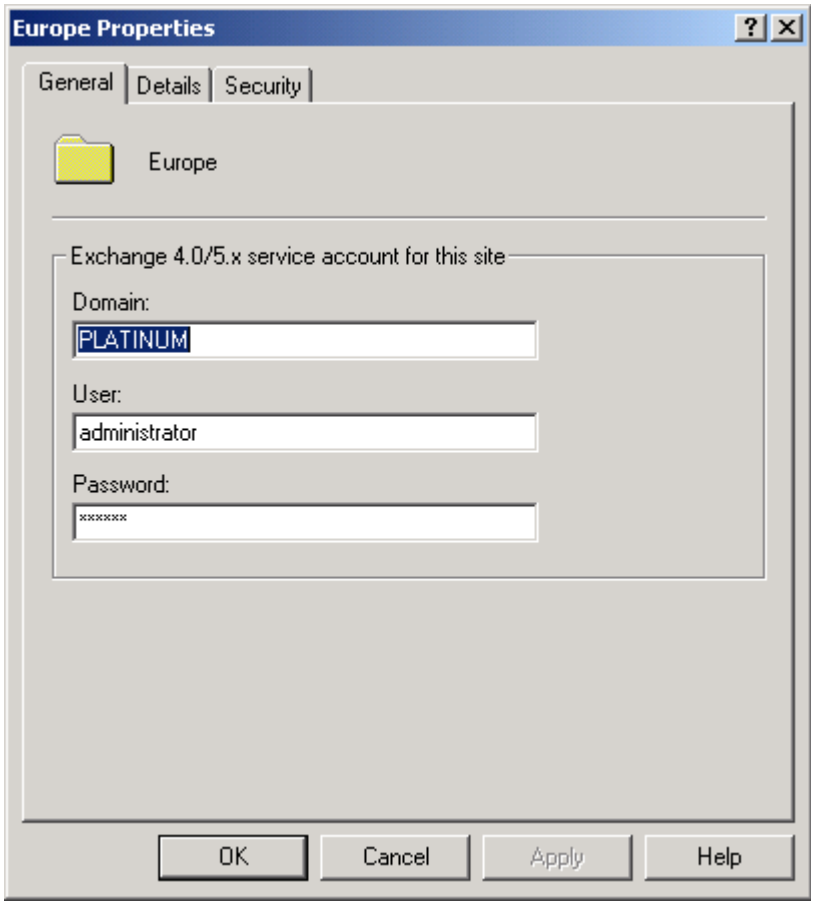
Route Coexistence

The ADC and SRS that are included with Exchange 2000 Server provide replication not only for the user objects in the site naming context, but also for the configuration naming context. This means that the Exchange 2000 server reads the Connected Sites and Address Space information from servers running earlier versions of Exchange, and places the data in its link state table, which replaces the Gateway Address Resolution Table (GWART). This allows Exchange 2000 to utilize any existing connectors, whether they are native or third-party. For example, Exchange 2000 does not include Professional Office System (PROFS) and SNA Distribution System (SNADS) connectors. If you need connectivity to these systems, you must install the connectors on an Exchange 5.5 server; however, Exchange 2000 can both send and receive messages through this route.

Similarly, any routes in Exchange 2000 are replicated by the ADC and SRS to servers running earlier versions of Exchange, so that those servers can also use connectors specific to Exchange 2000.

Site Services Account and Authentication

One issue to consider when you are deploying Exchange 2000 server in an existing Exchange 5.*x* site is that the servers must use a common Site Services Account for authentication. Two processes communicate with each other between Exchange servers in the same site: Directory Service and MTA. Attributes set on the Administrative Group object in Exchange System Manager control the user name and password used for authenticating to Exchange 5.*x* servers in the site.



In Exchange 2000, services no longer need to start up as a special Site Services Account. They can instead use the LocalSystem account, along with the other services that are running on the server.

It might be useful to understand why Exchange 4.0 and Exchange 5.*x* require a special account. In Microsoft® Windows NT® 4.0, general server processes start up as the LocalSystem account. The LocalSystem account is a regular user account, although it has a flag that states that it is used by the computer only. The password is randomly generated and stored on the domain controller when the new server joins a domain. The password for this account automatically changes every seven days. Although the LocalSystem account has a token to allow authentication against the domain, it does not have user credentials associated with it. The LocalSystem account, therefore, cannot be used for authentication between two servers. This limitation exists in Windows NT 4.0, but it does not apply in Microsoft® Windows® 2000. Authentication between two Windows 2000 servers use Kerberos, rather than Windows NT LAN Manager (NTLM), authentication. As a result, Exchange 2000 services on two different member servers can authenticate to each other without a special account. The advantages of moving away from a special account are as follows:

- The system administrator does not need to change the password for a logon account.
- A special Site Services Account password could come under attack because it is not feasible for the system administrator to lock the account after a certain number of failed logon attempts (locking the account would result in Exchange services being unable to authenticate with one another, which would cause services to be denied).
- The password is more secure because it consists of a random string of characters.

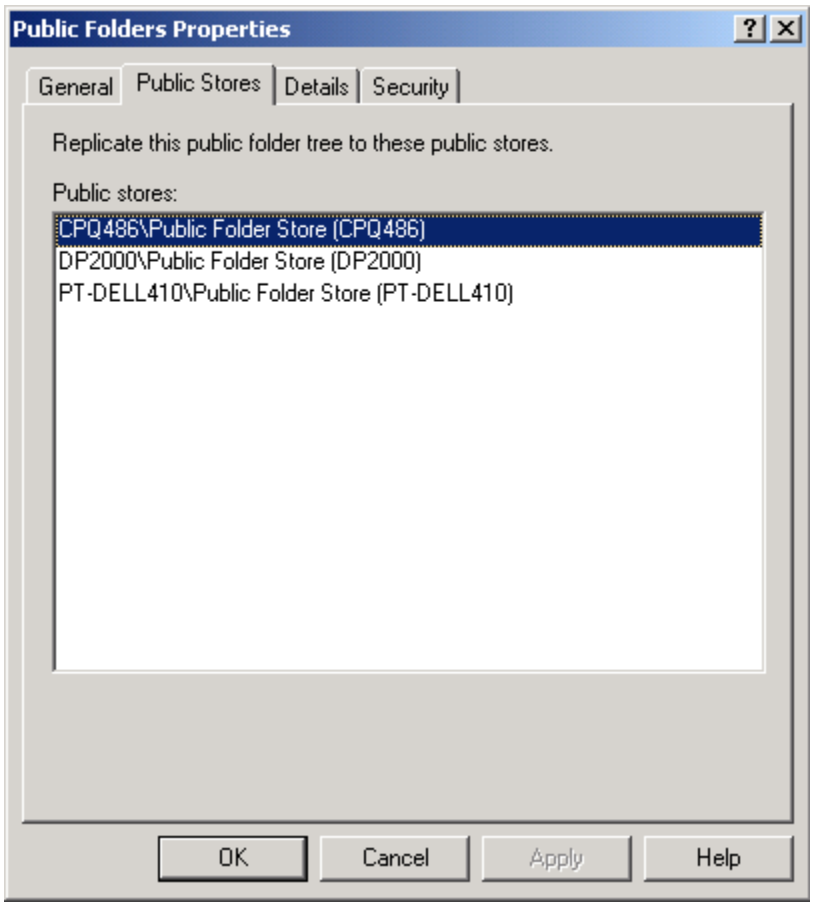
- The password automatically changes every seven days, making it very resistant to attack.

Exchange 2000 servers can always authenticate with one another using the LocalSystem account when they are installed in an existing Exchange 5.*x* site, but they use the account name and password specified on the Administrative Group object when authenticating against Exchange 5.*x* servers.

User Data Coexistence

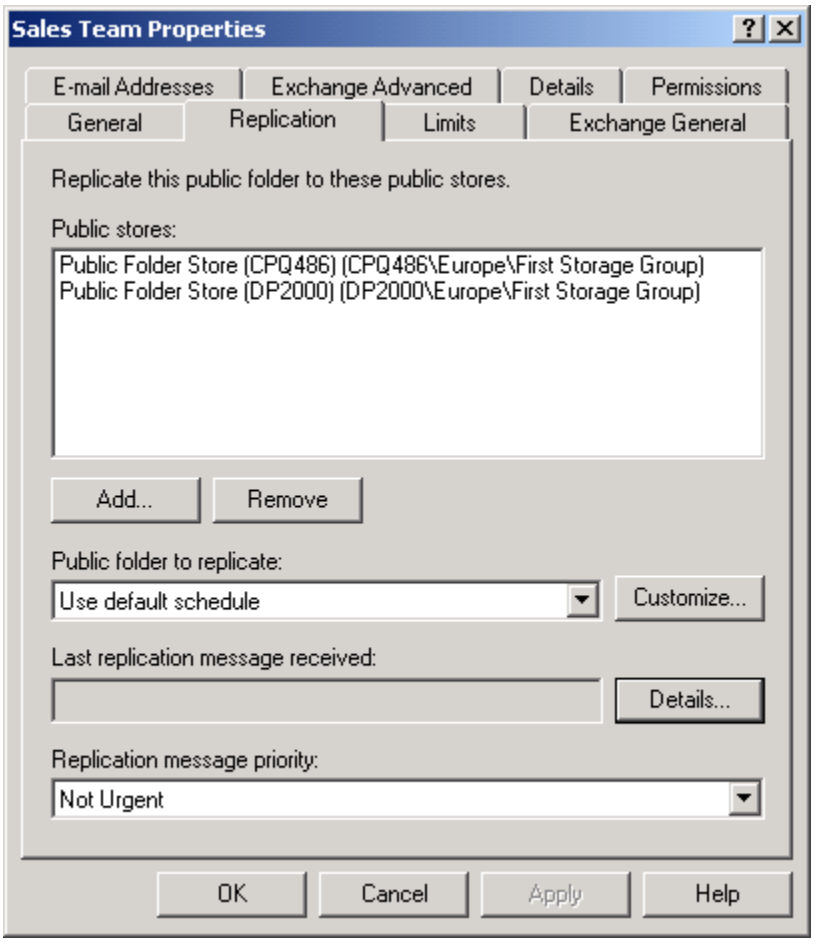
In general, there are few issues to consider when you are locating mailboxes on servers in a mixed-mode Exchange site. One deployment consideration is that delegate access can be performed only when users are on the same private information store on a single server, or deployed across multiple servers. A limitation in the EMSMDB32.DLL process on the client prevents delegate access between users on different mailbox stores on the same physical server.

Additionally, there are a few differences between public folders in Exchange 2000 and earlier versions of Exchange. It is possible to replicate individual public folders between Exchange Server 5.5 and Exchange 2000, and clients can access any replica. The public folder hierarchy is replicated between all versions of Exchange. Because Exchange 2000 supports multiple public folder trees, Exchange System Manager allows system administrators to designate the public store databases that receive a replica of a particular hierarchy. By default, only one hierarchy exists and it is called *Public Folders*. This is the hierarchy that is seen by MAPI clients such as Microsoft® Outlook®. You can create additional public folder hierarchies through Exchange System Manager and assign them to a set of public stores. Note that two public stores on the same server cannot hold the same hierarchy.



In the previous illustration, server CPQ486 is an Exchange 5.5 server, and servers DP2000 and PT-DELL410 are running Exchange 2000.

Data content can also be replicated between different versions of Exchange server; however, you can set a finer level of permissions on Exchange 2000 public folders. Because these cannot be represented in the Exchange 5.5 store, be careful when you are replicating security-sensitive public folders between servers of different versions.



Outlook Web Access Coexistence

The Microsoft® Outlook Web Access (OWA) utility in Exchange 2000 has been redesigned with additional features and scalability. Whereas OWA in Exchange 5.5 used a set of Microsoft® Active Server Pages (ASP) files to retrieve data from the information store and render it, the rendering process in Exchange 2000 takes place directly in the Exchange 2000 information store process. Because of the new OWA architecture, it is no longer possible to customize ASP files to change the basic user interface. You can, however, reuse the standard Exchange 2000 OWA components in existing applications.

If you have modified the ASP files for OWA in Exchange 5.5, you may want to keep both versions of OWA initially, and then slowly migrate your applications so that you can use the new development features of Exchange 2000. You can do this by “front-ending” an Exchange 2000 server with Exchange 5.5 OWA. Users make HTTP requests to the older version of OWA, which checks the Exchange directory for the data. A connection is then made to the Exchange 2000 server, where the data is retrieved.

Note You cannot “front-end” an Exchange 5.5 server with Exchange 2000 OWA.

Taking Advantage of Exchange 2000 Without Upgrading Existing Servers

For some organizations, upgrading all existing Exchange servers to Exchange 2000 will take time. But you can take advantage of many Exchange 2000 features by simply adding an Exchange 2000 server to an existing organization or site. The following table lists the features available without upgrading a site’s mailbox server to Exchange 2000.

Feature	***Available without upgrading the mailbox server?***
Web Folders	Yes, if an instance of the public folder exists on the Exchange 2000 server.
Web client (OWA)	Not available for mailboxes, but possible for public folders if a replica exists on the Exchange 2000 server.
Web Store access	Yes, if an instance of the public folder exists on the Exchange 2000 server.
URL access to store folders and items	Yes, if the desired data is hosted on the Exchange 2000 server.
Instant Messaging (IM)	Yes, the home server for an IM user can be different from the home mailbox server.
Exchange Conferencing Services	Yes (although not in Exchange 2000 Server Beta 3).
Public folder granular permissions	Yes, if the public folder is available only on the Exchange 2000 server.
Microsoft® Collaboration Data Objects (CDO) 2.0	Yes, this is a feature of Exchange 2000 Server.
CDO 3.0	Yes, but items to be manipulated must be located on the Exchange 2000 server.

Upgrading to Exchange 2000 Server

Methods of Upgrading

There are a number of ways to upgrade existing Exchange servers to Microsoft® Exchange 2000 Server. Your strategy and method will depend on various factors, such as the size and complexity of the existing deployment, the versions of Exchange Server deployed, the level of disturbance that users can accommodate, and whether new hardware is available. In general, there are three strategies for migration:

- Perform an in place upgrade of your Exchange 5.5 servers.
- Install Exchange 2000 on new hardware and then migrate mailboxes and public folders.
- Use the leapfrog approach, reusing hardware as the migration progresses throughout the organization.

Preparing for the Upgrade

You can carry out a number of tasks prior to the actual upgrade to Exchange 2000. You must perform these tasks regardless of the migration strategy you choose.

- Design and deploy Microsoft® Windows® 2000 and Active Directory. This does not have to be a full implementation; however, a basic forest must exist.
- Upgrade the primary domain controller (PDC) of the domain in which your Exchange Site Services Account has been created. The Site Services Account for Exchange 2000 must be a Windows 2000 security principal.
- Where possible, upgrade the PDC of your master accounts domain(s) to Windows 2000 and Active Directory. Essentially, to upgrade an existing Exchange server, the primary Microsoft® Windows NT® account of all mailboxes should be represented as user objects in Active Directory. Where it is not possible to perform the domain upgrade, you may end up with duplicate objects in Active Directory after the Windows NT 4.0 domain has been upgraded. In this case, you will need to use the Active Directory Account Cleanup Wizard, which is discussed later in this paper.
- The Active Directory schema must be extended to accommodate Exchange 2000. This can be done by the first Exchange 2000 server installed in the organization (the system administrator requires permissions to update the schema), or manually through the Active Directory Schema utility by running Exchange 2000 Setup with the **/SchemaOnly** command line switch.
- Test your existing forms and applications against an Exchange 2000 server to ensure compatibility. Remember that although Exchange 2000 includes Microsoft® Collaboration Data Objects (CDO) 3.0, earlier versions of CDO, such as 1.21, also work.
- Contact the vendors of any third-party software deployed (especially connectors and gateways) to ensure that their applications are compatible with Exchange 2000.

Active Directory and Domains

Although Exchange 2000 requires Active Directory to be running, it is not necessary to have Windows 2000 and Active Directory fully deployed before you install the first Exchange 2000 server. Exchange 2000 simply requires a base directory to be in place. The Active Directory that you use, however, should not be designed and deployed independently from the rest of the enterprise.

In a number of organizations, Exchange 2000 will drive the migration to Active Directory; however, unlike Windows NT 4.0 domains, you cannot install and upgrade Active Directory domains in isolation. The first Active Directory domain within a forest plays a very important role:

- The name of the first Active Directory domain is the name of the forest.
- Parent domains cannot be built above it.
- The domain cannot be removed at a later time.

Because of these parameters, it is recommended that the first domain in Active Directory be installed to act merely as a placeholder for the rest of the forest. No users exist in the domain and its name is completely static. When you install new domains or upgrade existing ones, they will simply link to the placeholder you have already created. Note that different trees can exist in the forest, so the name of the first domain is somewhat arbitrary.

For an in-depth discussion of this subject, see *PT102 – Exchange 2000 Directory Access and Integration with Windows 2000,* the third white paper in this series. It is critical that you plan your Active Directory carefully and seek assistance when necessary.

Hardware and Software Requirements for Exchange 2000 Server

The following list describes the recommended *minimum* hardware requirements for installing Exchange 2000 Beta 3.

- x86 Server:
  - Pentium Pro, Pentium II, or Pentium III processor, 200 MHz or above
  - 128 MB of RAM
  - Disk subsystem with at least 1 GB of available hard disk space
  - Network card

Because the Alpha platform is no longer supported by Compaq for 32-bit implementations of Windows 2000, an Alpha version of Exchange 2000 Server is not available.

Note The above requirements are simply recommendations for Exchange 2000 Beta 3 and are likely to change for the released product.

In addition to hardware, one of the following operating systems must be installed on the computer that will be running Exchange 2000:

- Microsoft Windows 2000 Server
- Microsoft Windows 2000 Advanced Server
- Microsoft Windows 2000 Data Center Server

Note To take advantage of features such as 4-node clustering and very large memory support (up to 64 GB), you should install Windows 2000 Data Center Server. Note, however, that Exchange 2000 Server Beta 3 does not support clustering.

Exchange 2000 Clients

Any existing Exchange messaging client can be used with Exchange 2000 Server, including the following:

- Microsoft® Exchange Client 4.0 and Exchange Client 5.0 (as included with the respective versions of Exchange Server)
- Microsoft® Outlook® 97, Outlook 98, and Outlook 2000
- POP3, IMAP4, and NNTP clients
- Standard Web browsers, including Microsoft® Internet Explorer 3.*xx*, Internet Explorer 4.*xx,* Internet Explorer 5.0; and Netscape Navigator 3.*x* and Netscape Navigator 4.*x*

The Exchange 2000 services that are available depend on the software running on the client workstation, as outlined in the follow table.

Service	***Required client software***
Accessing basic mailbox, address book, calendaring, and public folder data	Any existing messaging client
Scheduling an Exchange data conference	Outlook 2000
Joining an Exchange data conference	Internet Explorer 5.0 and Microsoft® NetMeeting® 3.01
Accessing the Web Store	Any client that has a network redirector
Accessing Web Folders	Internet Explorer 5.0
Microsoft® Outlook Web Access (basic mode)	Any browser that supports frames
Outlook Web Access (enhanced mode)	Internet Explorer 5.0
Instant Messaging	Microsoft® MSN™ Messenger client
Chat services	Any chat client
Public folder granular permissions	All clients (permissions are enforced by the Exchange store process)

What Differences Will Users Notice After the Upgrade?

In theory, an upgrade to the Exchange server will not affect the operation of the client. However, users will notice subtle changes after their server has been upgraded.

- Although the Global Address List still exists, earlier Exchange sites and containers are no longer visible in the user interface. Instead, the user sees Address Lists defined by the Exchange 2000 system administrator.
- The viewable directory data depends on the information that has been published to the Global Catalog server (for more information, see the white paper, *PT102 – Exchange 2000 Directory Access and Integration with Windows 2000*).
- Outlook Web Access (OWA) users will now access the new OWA Web client, which has been greatly improved over earlier versions. The richer features of the Web client are accessible only through Internet Explorer 5.0.
- If you are using Outlook 2000, users can now schedule online meetings using Exchange Conferencing Services.

In Place Upgrade Method

If your existing servers are running Exchange Server 5.5, you have the option of simply upgrading the databases and configuration data in place. This method involves taking the server offline and running the Exchange 2000 Setup program to perform the upgrade; however, because Exchange 2000 runs only on Windows 2000, if the server is running Windows NT 4.0 Server, you need to upgrade the operating system first. There are a number of advantages to the in place upgrade: existing hardware can be used, and the existing data in the information stores is converted very rapidly (approximately 8 GB per hour). This makes the upgrade process extremely fast. The overall speed of database conversion depends on the number of folders that exist, and not the total amount of data stored. The reason for this is that the bulk of the upgrade time is spent by the access control list (ACL) upgrader process, which replaces Exchange directory access control entries with objects from Active Directory.

Note Exchange 2000 Beta 3 does not support in place upgrades.

The following table lists the advantages and disadvantages of an in place upgrade.

Advantages	***Disadvantages and Issues***
• Uses existing hardware. • The database upgrade process is fast.	• Server must already be running Windows 2000 and Exchange Server 5.5. • Hardware must be capable of running Windows 2000 and Exchange 2000. • User downtime may be longer than with other migration methods.

Move Mailbox Upgrade Method

The move mailbox method of upgrading involves installing Exchange 2000 on new hardware, adding it to the existing Exchange site, moving the data to Exchange 2000, and then decommissioning the old servers. There are a number of advantages to this method, including reducing the disturbance to users and mitigating potential risk. The most significant disadvantage is the cost of purchasing new hardware. Some organizations will choose to employ this migration method because it provides a good opportunity to upgrade their hardware and software.

The advantages and disadvantages of the move mailbox method are outlined in the following table.

Advantages	***Disadvantages and Issues***
• Minimal user disturbance — the only downtime is the time it takes to move the user mailboxes. • It’s possible to directly upgrade users on Exchange Server 4.0 and 5.0. • It’s potentially possible to move users throughout the day or night. • It’s possible to upgrade connectors by simply moving them to the Exchange 2000 server. • No operating system or Exchange upgrade is required on the existing	• New hardware is required. • The Key Management Server (KMS), foreign connectors, and other components are more difficult to move using this method.

server.

- Not all users on an existing server have to move at the same time.
- Contingency planning is easier because the existing server is still available.

The move mailbox method works best if the data you are moving consists only of mailboxes and public folders. If you currently have dedicated servers for these roles, you may want to think about using this method for converting user data, and using the in place upgrade method for upgrading KMS, legacy connector, and bridgehead Exchange servers, because these do not directly affect user access to Exchange data.

Steps for Moving Mailboxes to Exchange 2000

1. Create a plan for moving users (which users, how many at a time, and when to move them). Note that moving a batch of users at the same time preserves the single instance of any messages shared by those users.
2. Verify that the users you are moving have Windows accounts in Active Directory.
3. Install Exchange 2000 Server on new hardware and join the existing Exchange site.
4. Consider temporarily enabling circular logging to reduce the amount of disk space used by transaction log files during the move.
5. Verify that the Exchange 2000 server is accessible to user computers.
6. Instruct the users you are moving to exit Outlook and other mail-based applications.
7. Use Exchange System Manager to move the mailboxes.
8. Verify that the mailboxes have been moved successfully.
9. Instruct users to log on to the network using Outlook or other mail-based application. The client profile will be updated automatically.

Steps for Moving Public Folders to Exchange 2000

1. Using the Exchange 5.5 Service Pack 3 (SP3) Administrator program, replicate existing public folders on the server to the new Exchange 2000 server.
2. After giving replication time to complete, during a time of low network activity, verify replication consistency with a tool such as PFAdmin from the *Microsoft® BackOffice® Resource Kit.*
3. Remove the replicated instances from the old Exchange 5.5 server.

Users automatically connect to the Exchange 2000 public folder when they next access their mail client.

Leapfrog Upgrade Method

The leapfrog method of upgrading to Exchange 2000 is very similar to the move mailbox method described previously. One of the main drawbacks of the move mailbox method is that it can be costly to purchase new servers; existing Exchange servers may already be running on fast, reliable hardware.

The leapfrog method allows the flexibility of the move mailbox method, but does not require you to purchase new hardware for each existing server. Essentially, an organization can purchase one or two new servers while upgrading the whole organization. The move mailbox method is used to move data onto the new servers, and old Exchange servers are then upgraded (or reinstalled) with Exchange 2000, verified as

stable, and then redeployed. Essentially, after data has been moved from a server, the same hardware can be used to upgrade another server.

The advantages and disadvantages of the leapfrog method are described in the following table.

Advantages	***Disadvantages and Issues***
• Minimal user disturbance — the only downtime is the time it takes to move the users mailbox between the servers. • It's possible to directly upgrade users on Exchange 4.0 and Exchange 5.0. • It's potentially possible to move users throughout the day or night. • No operating system or Exchange upgrade takes place on the existing server until users are fully moved and the new server verified to be working. • Not all users on an existing server have to move at the same time. • Contingency planning is easier because the existing server is still available halfway through the migration. • Existing hardware investment is maintained. • Minimal new hardware is required for the migration.	• Server names change as users are moved onto new equipment. • The KMS, foreign connectors, and other components are difficult to move using this method. • The migration is slightly more difficult to plan and execute.

Server Upgrade Order

After choosing a migration method, the next step is to decide which servers to upgrade to Exchange 2000 first. With earlier Exchange upgrades, you may have upgraded the bridgehead servers first, and then mailbox servers. With Exchange 2000, you may want to migrate your mailbox and public folder servers first, so that users and system administrators can immediately take advantage of the advanced messaging and collaboration features in Exchange 2000. Exchange 5.*x* servers, which have foreign connectors based on the Exchange Development Kit (EDK) — such as fax and pager gateways — may need an additional upgrade from third-party vendors before the server software can be upgraded to Exchange 2000, delaying a full implementation of Exchange 2000.

Steps Performed During the Upgrade Process

Because of major architectural changes between Exchange Server 5.5 and Exchange 2000, there are many steps in the upgrade process to perform for each component.

Directory Upgrade

When you upgrade an existing Exchange 5.5 server to Exchange 2000, the data stored in the local directory database (Dir.edb) is transferred to Active Directory. After the data has been successfully migrated, the old directory database is deleted.

The following tables list Exchange 5.5 components and their Exchange 2000 or Active Directory equivalents.

Naming Context Conversion

Exchange 5.5 context	***Exchange 2000 or Active Directory equivalent***
Organization	Organization in configuration naming context
Address Book Views	Data converted to Address Lists **Note** There is no backward replication to Address Book Views
Site	Objects matched to Active Directory objects in the domain naming context
Configuration	Configuration naming context
Schema	Not represented in Active Directory because Exchange 5.*x* schema is not extensible

Object Conversion

Exchange 5.5 object	***Exchange 2000 object***
Mailbox	Mailbox-enabled User
Custom Recipient	Mail-enabled Contact
Distribution List	*For a native-mode domain:* Mail-enabled Universal Group (type: Security) *For a mixed-mode domain:* Mail-enabled Universal Group (type: Distribution)
Public Folder	Folders visible in the Address Book are represented by public folder objects in the nominated container in Active Directory

If the server being upgraded hosts directory replication connectors to sites running earlier versions of Exchange, Site Replication Service (SRS) is deployed to retain the existing replication configuration.

Store Upgrade

The unlimited store in Exchange Server 5.5 means that some large organizations are running databases that are larger than 100 GB. Exchange 2000 is designed to ensure that existing data does not have to go through a lengthy conversion process, regardless of its size.

During the upgrade process, existing information stores are stopped and verified to be in a consistent state. Because of structural changes in the transaction log files, existing files are cleared from the disk. Binary files are then copied to update the schema and metabase, and the store process is restarted. The act of restarting the store automatically creates a new transaction log file (Edb.log) and streaming database files (Priv1.stm and Pub1.stm) for both the private and public information stores. The ACL upgrade process then runs against the folders in the databases to ensure that all previous Exchange 5.5 access control entries are replaced with objects from Active Directory.

Additionally, there are some page changes made at the Microsoft® Extensible Storage Engine (ESE) level, but these are made dynamically as users request the data.

MTA and Connector Upgrades

Because minimal changes have been made to the Exchange 2000 message transfer agent (MTA), only newer configuration files need to be copied to upgrade the MTA. Any existing X.400 Connectors are intact after the upgrade, although the TP4 protocol is no longer supported. Site connectors are transformed into Routing Group Connectors, and the Internet Mail Service (IMS) configuration is transferred to a Simple Mail Transfer Protocol (SMTP) connector and Microsoft® Internet Information Service (IIS).

Legacy Mail System Connector Upgrades

Any existing connectors, such as cc:Mail, Microsoft Mail, Lotus Notes, and GroupWise, are automatically upgraded during the setup process, and all existing configuration data is migrated to Active Directory. Although the interface and configuration of the connectors will look very familiar after the upgrade, significant architectural changes have been made to these components. Note that Exchange 2000 does not directly support Professional Office System (PROFS) and SNA Distribution System (SNADS) connectors. These will need to run on existing Exchange 5.5 servers.

After the Upgrade

After your Exchange server is running Exchange 2000 Server, you can start taking advantage of the new features in Exchange 2000. To optimize Exchange 2000 features and services, consider performing the following tasks.

- Create multiple storage groups and databases, and then divide users between them to improve backup and recovery times.
- Inform users of the new Outlook Web Access client.
- Enable access to the Web Store.
- Deploy a front-end/back-end configuration for additional scalability if users use POP, IMAP, or HTTP mail clients.
- Configure Instant Messaging and Exchange Conferencing Services to improve functionality.
- Configure Exchange applications to use new features, such as the following:
    - CDO 3.0
    - CDO System Management
    - Workflow
    - The Web Store
    - URL access to objects within the store
    - Item-level and property-level permissions in public folders

Domain Upgrades and Active Directory Account Cleanup

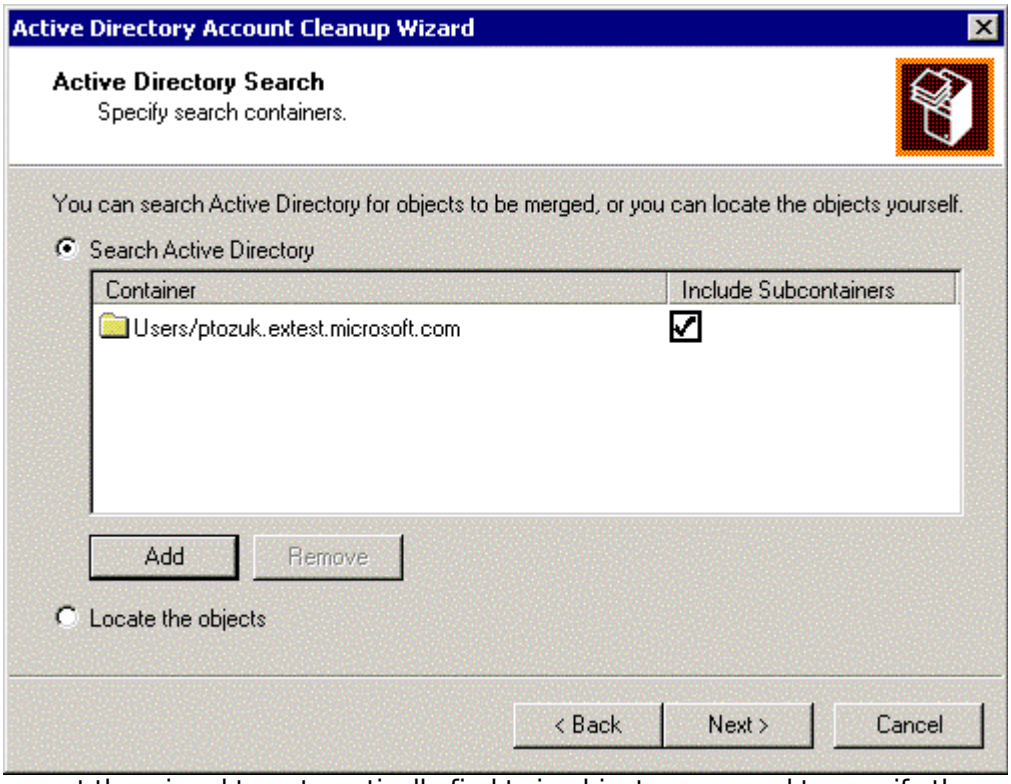
Microsoft® Exchange 2000 Server relies heavily on Active Directory for configuration and Address Book information. When possible, you should upgrade the primary domain controller (PDC) of the master account domain to Microsoft® Windows® 2000 and Active Directory before you deploy Exchange 2000; however, in large organizations this may not be possible, and the Exchange 2000 deployment and upgrade must move ahead even though user account domains are still running on Microsoft® Windows NT® 4.0. This is not a significant problem, but you will need to use the Active Directory Account Cleanup Wizard to remove duplicate — or twin — accounts after you upgrade the Windows NT 4.0 domain to Active Directory.

For example, a user named Joe Bloggs has a mailbox located on an Exchange 5.5 server, and his primary Windows NT account is mapped to *JBloggs,* an account in a Windows NT 4.0 domain. Because other users have been moved to Exchange 2000, Joe's mailbox must be represented in Active Directory, which is the source of all address list information. The system administrator configures a connection agreement in the Active Directory Connector (ADC) to replicate Joe's mailbox object to an appropriate container or organization unit in Active Directory. Because the ADC cannot perform a security match between the security identifier (SID) of Joe's account and a user object in Active Directory, it must create an instance of a new object (with a new SID). By default, a connection agreement creates a disabled user account. This is a full account with a security principal; however, Joe cannot log on to this account directly. For now, Exchange 2000 users can send mail to Joe and he can send mail to them.

Later, the company is ready to upgrade the Windows NT 4.0 domain where Joe's user account exists. This domain will be joined to the existing Active Directory forest. Although the upgrade is successful, Joe's account is represented twice in Active Directory: once with his newly upgraded account, and once with the disabled user account created by the ADC.

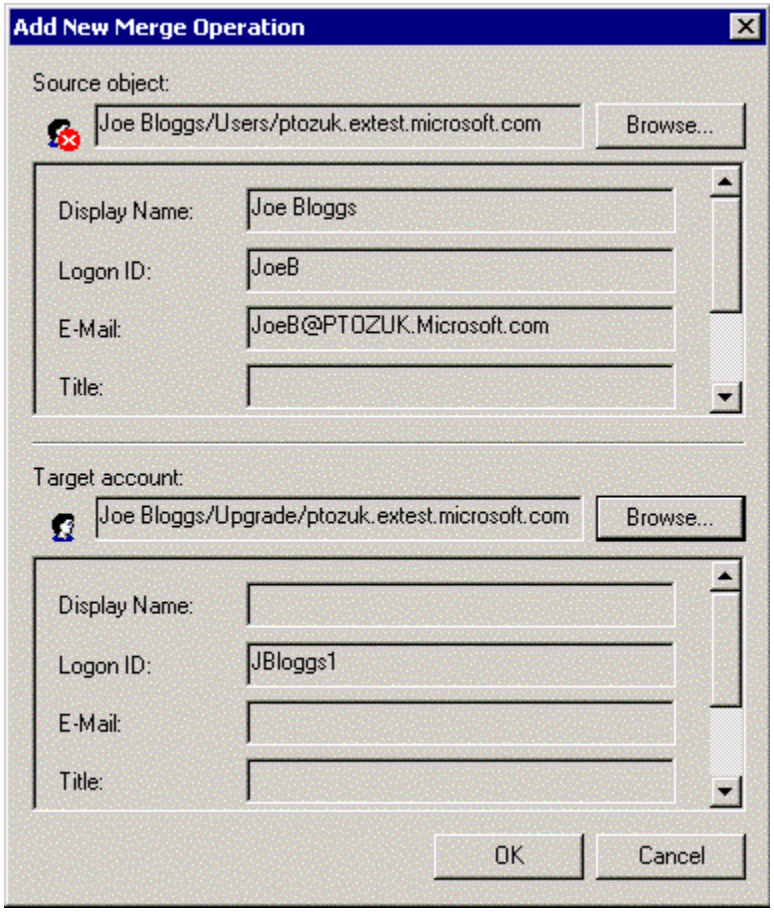
To merge the two accounts into one, execute the Active Directory Account Cleanup Wizard. The Adclean.exe utility is located in the \Support\Adclean directory on the Exchange 2000 installation CD-ROM.

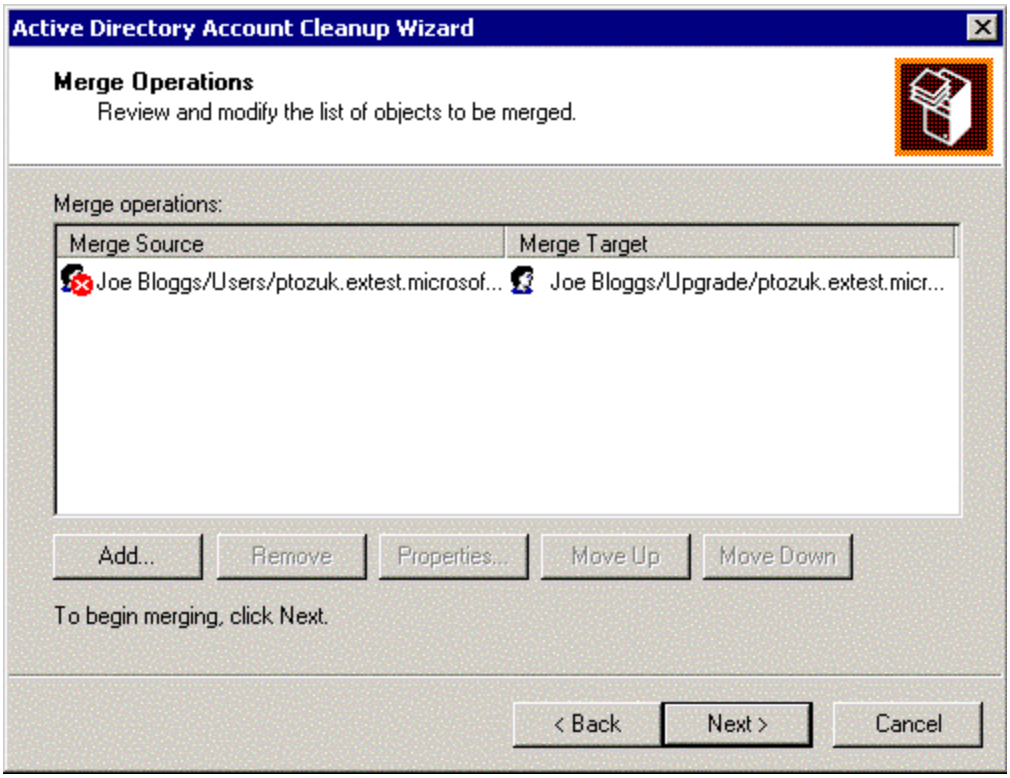
There are two options for running the Active Directory Account Cleanup Wizard. The first is to allow the utility to search for all twin objects; the wizard will then ask you if you want to clean them up. The second option is to manually enter the accounts that you want to merge.



If you want the wizard to automatically find twin objects, you need to specify the containers and organization units to search.

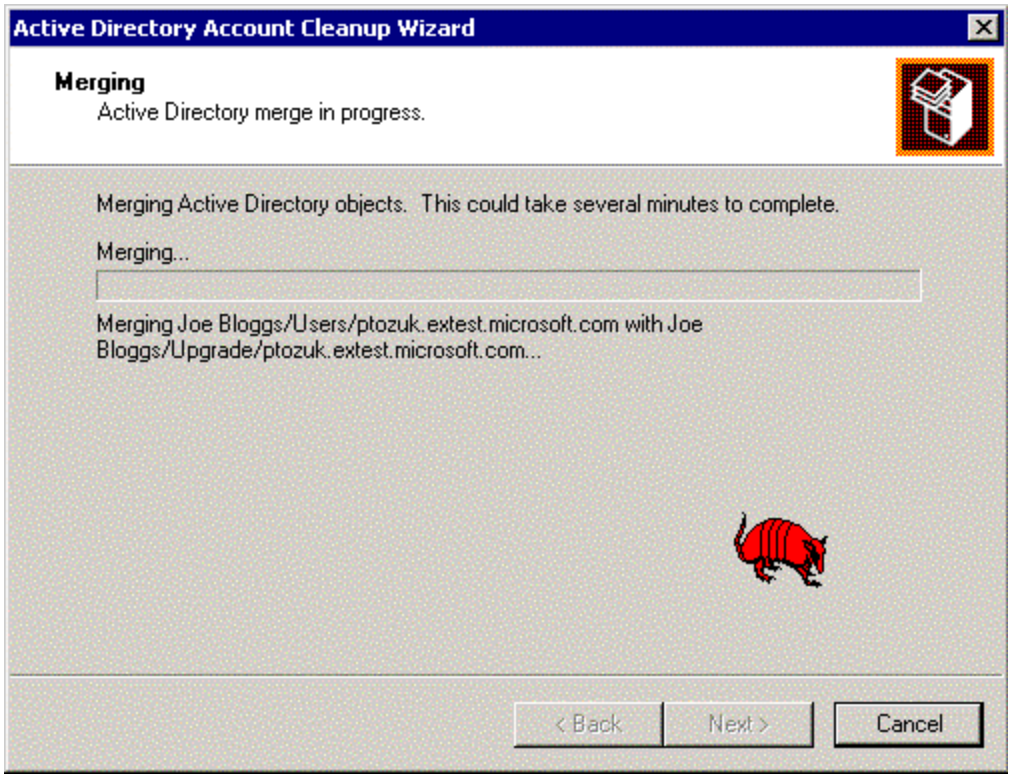
The wizard matches twin objects using SIDs; for example, when the ADC originally created the disabled user object for Joe in Active Directory, although the object was given a new SID, it wrote the Windows NT 4.0 SID into an attribute called **msExchMailboxSecurityDescriptor**. After Joe's Windows NT 4.0 account was moved as part of the domain upgrade process, his SID from that account was created in Active Directory. The account cleanup wizard can match the two security identifiers and present a list of accounts that can be merged.

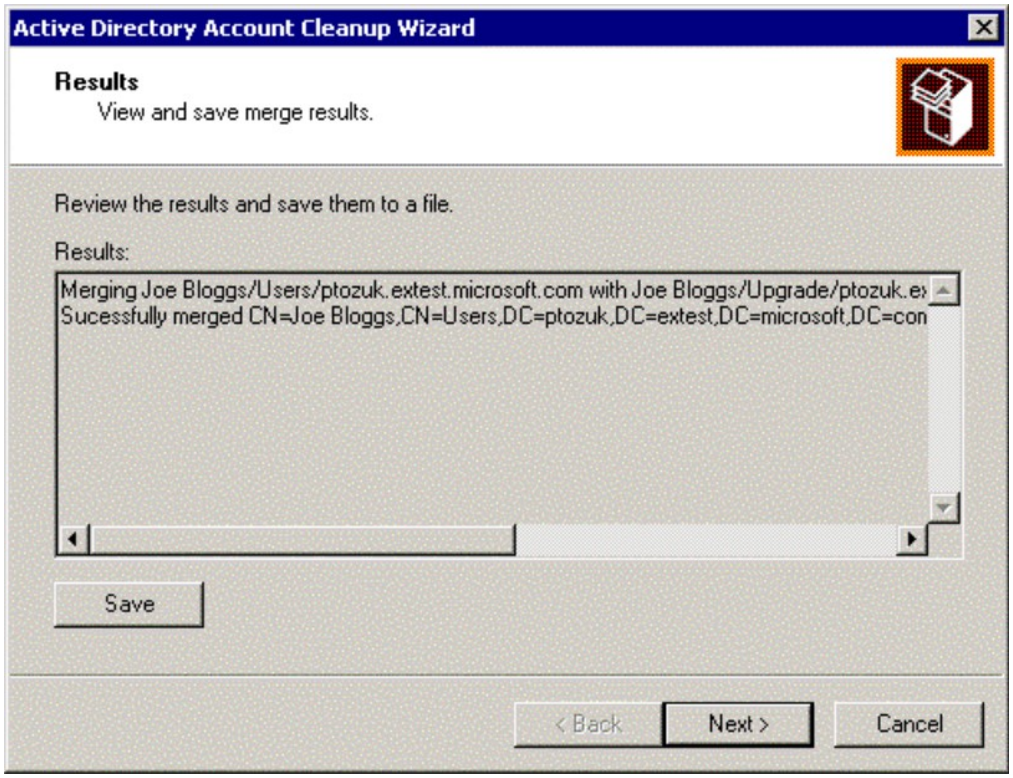




If you choose to manually specify the accounts to be merged, you need to select both the source object (the twin) and the target object. If the objects are merged successfully, the

attributes of the source object are merged with the target object, and the source object is deleted from the directory. The source object is the disabled user account that was created by the ADC, and the target object is the account that was upgraded from Windows NT 4.0. You cannot specify a disabled user account as the target object.

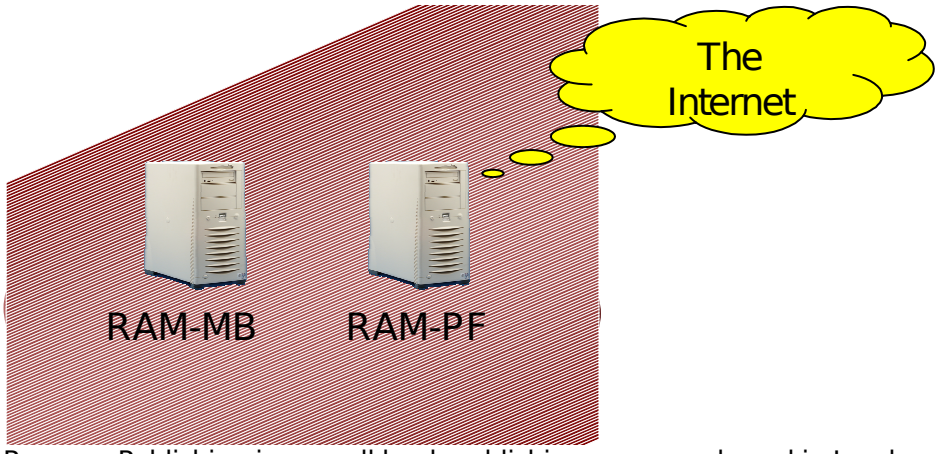

Active Directory Account Cleanup Wizard
Merging
Active Directory merge in progress.
Merging Active Directory objects. This could take several minutes to complete.
Merging...
Merging Joe Bloggs/Users/ptozuk.extest.microsoft.com with Joe Bloggs/Upgrade/ptozuk.extest.microsoft.com...
< Back
Next >
Cancel



Upgrade Scenarios and Walkthroughs

The following scenarios walk you through the migration to Microsoft® Exchange 2000 Server at two fictitious companies. Each scenario poses slightly different challenges and requires different methods of migration.

Scenario 1: Ramona Publishing, Ltd.



Ramona Publishing is a small book publishing company based in London. It has two Exchange servers in a single Exchange site, both of which are running Exchange Server 5.5 Service Pack 3 (SP3) on top of Microsoft® Windows NT® 4.0 Server, and both servers are in the same domain. The first Exchange server is dedicated to mailboxes, and the second hosts the public folders that the company uses for their book tracking database. The public folder server also has an Internet Mail Service (IMS) connection to the Internet over a dial-on-demand ISDN line. All 200 users in the company use Microsoft® Outlook® 98.

Ramona Publishing wants to upgrade to Exchange 2000 Server to take advantage of the Web Store and granular permissions in public folders. The company considers the upgrade vital for supporting a new collaborative application that is under development.

The Upgrade Process

Ramona Publishing has decided to upgrade both servers to Microsoft® Windows® 2000 and Exchange 2000 over a single weekend. The existing servers are relatively new, fast, and have a lot of memory, so there is no need to purchase new hardware. Users are happy with their existing messaging client, so the company will not upgrade to Microsoft® Outlook® 2000 at this time.

The end-to-end upgrade process for the servers is as follows:

1. Create a test mailbox on RAM-PF.
2. Ensure that documentation is up-to-date, including the configuration of the IMS.
3. Back up both servers (OS/Registry/Exchange Databases) to tape.
4. Upgrade RAM-PF (the primary domain controller) to Windows 2000.
5. Upgrade RAM-PF to Exchange 2000.
6. Log on to the test mailbox on RAM-PF to validate the upgrade process.
7. Upgrade RAM-MB to Windows 2000.
8. Upgrade RAM-MB to Exchange 2000.
9. Log on to mailboxes on RAM-MB to validate the upgrade process.

10. Immediately back up the upgraded servers to tape.

Notes

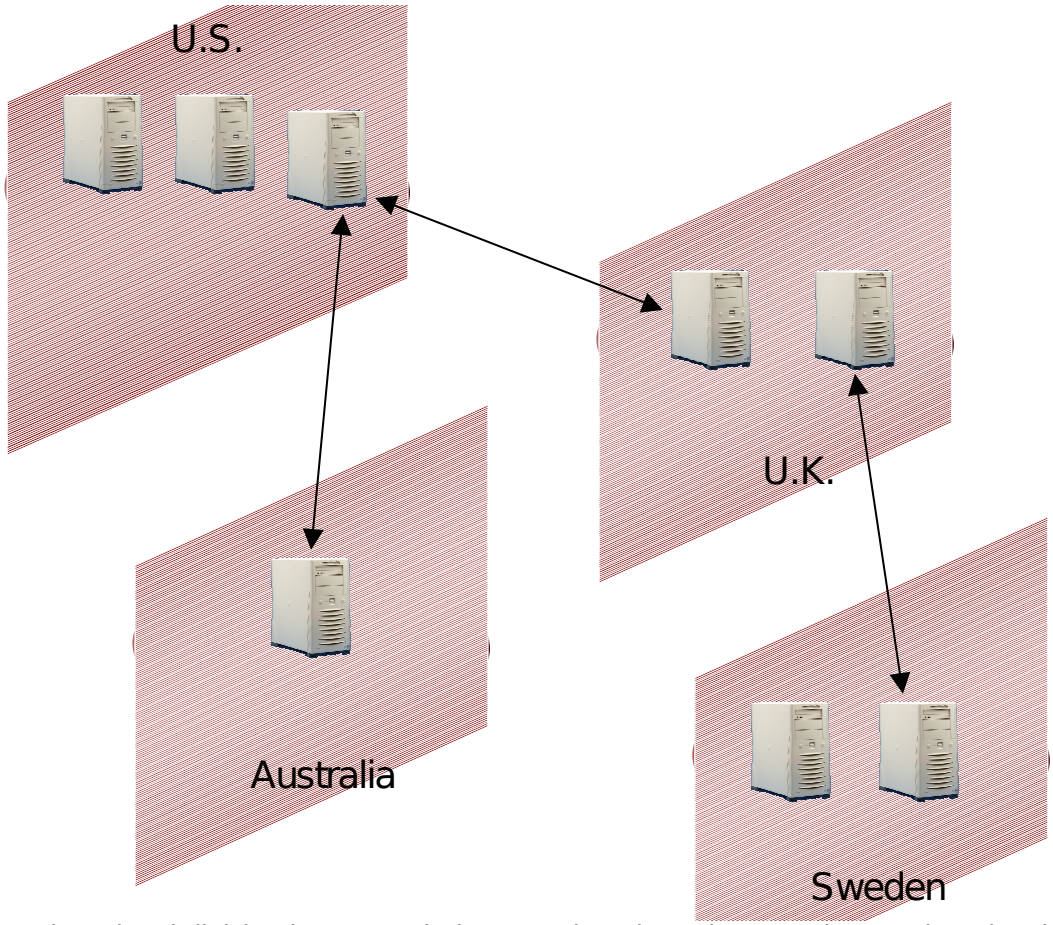
Upgrading the domain primary domain controller (PDC), RAM-PF, first was a requirement to move the legacy domain to Active Directory. When this server was upgraded to Exchange 2000, a connection agreement was created to the other Exchange 5.5 server in the site (RAM-MB). This would have provided coexistence if Ramona had opted to upgrade the servers over separate weekends. Additionally, the IMS that existed on RAM-PF was automatically converted to a Simple Mail Transfer Protocol (SMTP) connector, so reconfiguration was not necessary.

When the second server was upgraded to Exchange 2000, the connection agreement was destroyed because no Exchange 5.5 servers existed in the legacy site.

Scenario 2: ProElectron, Inc.

ProElectron, Inc., is a successful electrical and lighting manufacturing company with offices in four countries: the U.S., the U.K., Sweden, and Australia. The company currently uses a mixture of Exchange 5.0 and Exchange 5.5, mainly to provide e-mail communications between their 4,000 employees.

Because of ProElectron's decentralized IT structure, each national division has its own budget, resulting in a proliferation of multiple client versions, including Microsoft® Exchange Client 5.0, Microsoft® Outlook® 97, and Outlook 98. In addition, some Exchange servers are older computers, with insufficient disk space and memory.



Each national division has one Windows NT domain and one Exchange site. The sites are connected together using X.400 Connectors over a private 128 KB/sec. WAN. The X.400 Connectors follow the underlying WAN infrastructure. The types of servers are listed in the following table.

Server	*OS and Exchange version*	*Comments*
USA-MBX-01	Windows NT 4.0 (BDC) and Exchange Server 5.5 SP2	Server has 300 mailboxes
USA-MBX-02	Windows NT 4.0 (BDC) and Exchange Server 5.5 SP2	Also has public folders
USA-CON-01	Windows NT 4.0 (member) and Exchange Server 5.5 SP1	Connector server for other sites
UK-MAIL1	Windows NT 4.0 (PDC) and Exchange Server 5.0 SP2	Server crashes once a week so the mailboxes have been moved to UK-MAIL2
UK-MAIL2	Windows NT 4.0 (BDC) and Exchange Server 5.5	None
SW-MBX-001	Windows 2000 and Exchange Server 5.5 SP2	Installed with the domain name ProElec-10.se
SW-MBX-002	Windows NT 4.0 (BDC) and Exchange Server 5.5 SP2	None
OZ-EXCH	Windows NT 3.51 (PDC) and Exchange Server 5.0 SP1	Server is older and has significant performance problems

Reasons for Migrating to Exchange 2000

Each national division has a compelling reason for moving to Exchange 2000. The company feels that it has deployed a good, reliable messaging system and would like to venture into application development. Management believes that the functionality in Exchange 2000 will enable the company to be more effective in this area. Management also feels that ProElectron could consolidate some of its existing Exchange servers and take advantage of multiple databases on a single server.

ProElectron can see how Instant Messaging and Data Conferencing Services will help business communications, so the company wants to pilot these services after installing Exchange 2000.

From a user standpoint, some company managers travel between the different countries and would like to access their mailboxes from different locations. Although they currently use Microsoft® Outlook Web Access (OWA) in Exchange Server 5.5, they would like greater functionality and an interface that looks more like the full Outlook application.

Challenges

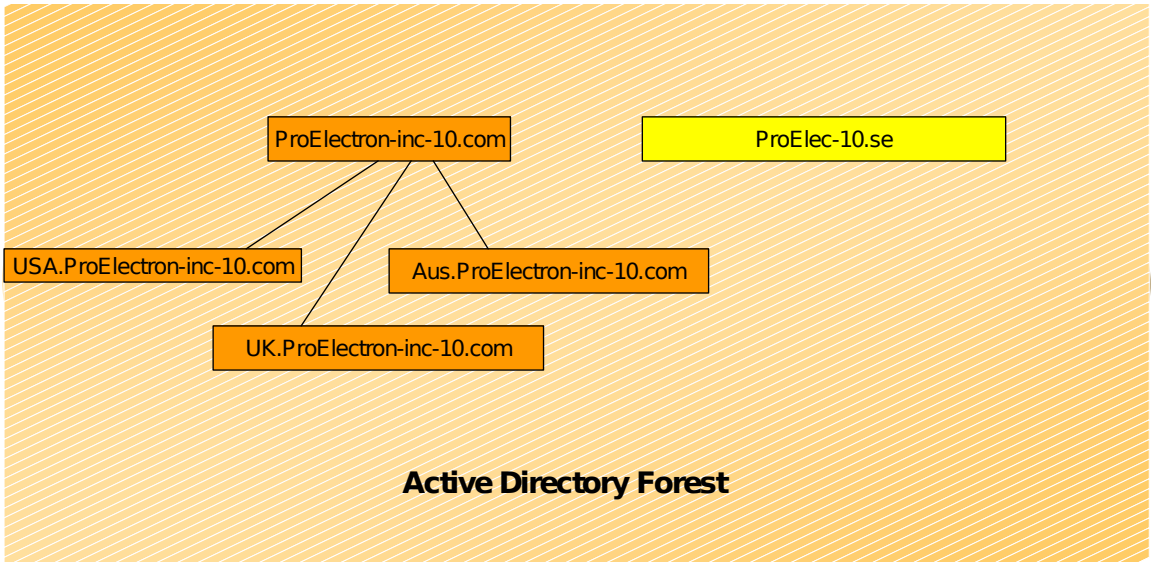
By far, the most important consideration for moving ProElectron’s environment to Exchange 2000 is that an Active Directory domain has already been created in Sweden: ProElect-10.se. Because the company wants the rest of its network to be part of this same Active Directory forest, all divisions must link to this root domain. Another consideration is that this root domain cannot be replaced later on (without reinstalling the entire forest), and cannot have parent domains. The issue, therefore, is whether to remove the current Active Directory and start over, or to build on top of the existing structure.

ProElectron has decided on the latter option for a few reasons. First, they have registered the ProElectron-inc-10.com domain with InterNIC, and the company doesn’t plan to change their domain name in the future. Second, there are 1,000 users in Sweden, and the company does not want to retrofit Active Directory in the Sweden domain.

The company has chosen, therefore, to create a standalone domain of ProElectron-inc-10.com in the U.S., because the domain can be implemented as a separate tree within the existing forest. The original root domain will continue to exist and serve the Swedish user population only. The company will protect the root domain through permissions and will rename it to a more appropriate domain when Active Directory supports domain renaming.

To retain its decentralized management, and considering the speed of its network connections, the company does not want to consolidate on its existing Windows NT domains. The domains, therefore, will be upgraded in place with no additional changes.

An additional challenge is that not all divisions of the company are ready to move to Exchange 2000 in the same time frame, so seamless coexistence is critical. The U.S. division is pushing for the upgrade, so it will move first.



Upgrade Methodology

After much thought, ProElectron made the following architectural changes to their messaging environment during their move to Exchange 2000.

- Because of the low utilization of the two mailbox servers in the U.S., they will be consolidated into one server, USA-MBX-01. Multiple databases will be used to ensure that the recovery service level agreements can be met.
- UK-MAIL1 seems to be crashing because of a hardware problem. The server was purchased four years ago and needs to be upgraded; however, to reduce total cost of operation, the money set aside for this will be spent on upgrading the memory on UK-MAIL2, where all of the data will be consolidated.
- Because of the levels of software running on the Australian Exchange server, the risk and time associated with a double upgrade, and the slow performance of the computer, the company has decided to purchase a brand-new server as a replacement.

U.S. Upgrade Process

1. Use a relatively low-powered server to create the ProElectron-inc-10.com domain, ensuring that a new tree is created in the existing ProElec-10.se forest.

2. Upgrade the PDC to Windows 2000 and create the USA.ProElectron-inc-10.com domain.
3. Back up the Exchange servers (OS/Registry/Exchange Databases) to tape.
4. Move all mailboxes from USA-MBX-02 to USA-MBX-01.
5. Replicate all public folders from USA-MBX-02 to USA-MBX-01 and wait for completion.
6. Remove all public folder instances from USA-MBX-02.
7. Ensure that all user profiles have moved to USA-MBX-02 (this can be done by looking at the last logon time for user mailboxes).
8. Remove the USA-MBX-02 Exchange server from the site (this was not the first server).
9. Upgrade USA-CON-01 to Windows 2000 (in the USA.ProElectron-inc-10.com domain).
10. Upgrade USA-CON-01 to Exchange 2000.
11. Verify that connectivity to the other Exchange sites still exists.
12. Upgrade USA-MBX-01 to Windows 2000.
13. Upgrade USA-MBX-01 to Exchange 2000.
14. Verify that the upgrade process was successful.
15. Implement three new private information stores and evenly distribute the mailboxes.
16. Immediately back up the upgraded servers to tape.

U.K. Upgrade Process

1. Back up the Exchange servers (OS/Registry/Exchange Databases) to tape.
2. Install and configure the new hardware in UK-MAIL2.
3. Promote UK-MAIL2 to be the PDC.
4. Move all mailboxes and public folder data from UK-MAIL1 to UK-MAIL2.
5. Move the X.400 Connector from UK-MAIL1 to UK-MAIL2.
6. Ensure that all user profiles have changed over to UK-MAIL2 (this can be done by looking at the last logon time for user mailboxes).
7. Follow instructions in the Microsoft Knowledge Base article Q152959 to remove UK-MAIL1 from the site (this was the first server), but keep it running as the BDC in the interim.
8. Upgrade UK-MAIL2 to Windows 2000.
9. Upgrade UK-MAIL2 to Exchange 2000.
10. Verify that the upgrade process was successful.
11. Immediately back up the upgraded server to tape.
12. Install a relatively low-powered spare server to be a domain controller for the U.K. domain and decommission UK-MAIL1.

Sweden Upgrade Process

1. Back up the Exchange servers (OS/Registry/Exchange Databases/Active Directory) to tape.
2. Upgrade SW-MBX-001 to Exchange 2000.

3. Verify that the upgrade was successful.
4. Upgrade SW-MBX-002 to Windows 2000.
5. Upgrade SW-MBX-002 to Exchange 2000.
6. Verify that the upgrade was successful.
7. Immediately back up the upgraded servers to tape.

Australia Upgrade Process

1. Test the new server hardware thoroughly for 72 hours with diagnostic software.
2. Back up the Exchange server (OS/Registry/Exchange Databases) to tape.
3. Install a separate low-powered server into the domain and promote it to be the PDC.
4. Upgrade the low-powered server to Windows 2000.
5. Install Exchange Server 5.5 SP3 on the low-powered server and join the existing site.
6. Install the new Exchange server with Windows 2000 (AUS-MBX-01).
7. Install Exchange 2000 on AUS-MBX-01, specifying that the server join the existing site.
8. Move the mailboxes and public folder data from OZ-EXCH to AUS-MBX-01.
9. Immediately back up AUS-MBX-01 to tape.
10. Ensure that all user profiles have moved to AUS-MBX-01 (this can be done by looking at the last logon time for user mailboxes).
11. Decommission OZ-EXCH following the instructions in Microsoft Knowledge Base article Q152959.
12. Remove Exchange server from the low-powered server.

Notes

The upgrade process for the Australian Exchange server is a little more complex than it appears. Because the existing server was a PDC and there were no BDCs in the domain, the domain was vulnerable to failure; therefore, the first task was to make the domain resilient by adding a secondary domain controller. The other reason for installing a backup computer is that you cannot join a Windows 2000 domain controller to an existing Windows domain in which the PDC is not running Windows 2000. Additionally, ProElectron had to install Exchange Server 5.5 on this extra computer because the company wanted the new Exchange 2000 server to join the existing site, and because the existing server was running Exchange Server 5.0, the Active Directory Connector (ADC) connection agreement could not be configured.